

necessary to remove numbers of them each year. Several of these I transplanted to a favorable habitat about two miles away and now have some fine ferns growing there. The old clumps follow the habit of the obtuse woodsia by dying outwards from the middle and producing some fronds a year or two longer on the outer circle. The fronds of the young plants usually begin to appear soon after the middle of April and those of the old plants about the close of April. One year, however, the first fronds were out on April 7. A large percentage of the fronds are fertile. The black or black-brown sporangia ripen during the last week in June and mature fruit may sometimes be found on succeeding fronds as late as September. The bulblets begin forming as early as the middle of May and some are falling by the middle of July. During July and August I have found bulblets, still clinging to the fronds, which had sprouted to a length of one-half to three-fourths of an inch.

KUTZTOWN, PA.

(To be concluded)

Notes and News

LYCOPODIUM SELAGO VAR. MIYOSHIANUM IN NORTH AMERICA.—Since *Lycopodium Selago* var. *Miyoshianum* does not seem to have been recorded from North America, it will not be out of place to state its synonymy and its diagnostic characters.

LYCOPODIUM SELAGO L., var. MIYOSHIANUM Makino, Bot. Mag. Tokyo xvi. 199 (1902); *L. chinense* Christ, Nuovo Giornale Bot. Italiano iv. 101 (1897); *L. Miyoshianum* Makino, Bot. Mag. Tokyo xii. 36 (1898). Leaves densely crowded, "ascending or spreading in the upper and mostly reflexed in the lower portion of the stem, narrowly linear, 4–6.5 mm. long, 0.5–0.6 mm wide, a little curved upwards, entire, gradually acuminate with a fine point, sessile, . . . the upper surface

nearly plane, but a little convex in the inferior ones, the under surface somewhat convex, rather glossy, not firm in living specimens but moderately rigid when dry, green or yellowish green; midrib not conspicuous."

Asa Gray labeled a specimen of this plant, collected in Japan by C. Wright, "*Lycopodium Selago* L. var.," indicating that he felt it, with its abundant setaceous yielding leaves, to be different from *L. Selago* and its varieties, as he knew them.

The specimens cited below are in the Gray Herbarium.

JAPAN: Sapporo, June, 1898; Hakodadi Mountains, *C. Wright*, no. 1, Herbarium of the U. S. North Pacific Exploring Expedition under Commanders Ringgold and Rodgers, 1853-56.

ALASKA: Sitka, *Ferd. Bischoff*, Western Union Extension Telegraph Exploring Expedition, 1865-66 (transitional material).

BRITISH COLUMBIA: Ucluelet, May, 1907, *George Fraser*.

ROCKY MOUNTAINS: *Drummond*.

HAROLD ST. JOHN.

TWO SERIOUS FERN PESTS.—Ferns are ordinarily immune to serious damage both from insects and from plant diseases. The greenhouse varieties suffer to some extent from mealy bug, scale, white fly, and a few other common insects, but serious damage can usually be avoided if sufficient care is taken. *Adiantums* sometimes have their foliage damaged by eel worms. The bird's nest fern often develops brown streaks in its leaves through an unidentified cause. Fern prothallia are very subject to damping off if the conditions vary from the narrow limits which these capricious plants demand. Hardy ferns have even fewer enemies. In fifteen to twenty years of interest in ferns, I remember seeing only one wild fern afflicted with a plant disease,

and that was a specimen sent me for identification as the host of some rust. Fern foliage is sometimes disfigured by desultory ravages of insects but rarely if ever to the serious injury of the fern plant. For this reason the discovery of two insects which may cause serious injury to ferns is worth recording as warning.

The Florida fern moth as it is sometimes called (*Ereopus Floridensis*) has gained entrance to some northern greenhouses. In one large establishment, it threatened to destroy at least as far as salability was concerned the entire stock of *Nephrolepis* varieties. The damage is due to the depredations of the larvae which are green, brown and black caterpillars, from $\frac{3}{4}$ to $1\frac{1}{2}$ inches long, and which feed on the fern leaves. The imago is an active nocturnal yellowish moth which remains carefully hidden by day. The pest was finally destroyed by the use of pyrethrum powder, the basis of most ordinary insect powders. This was applied by dusting about at the close of the day and was especially effective when all ventilation was stopped. Pyrethrum owes its effectiveness to a volatile constituent. The powder as purchasable varies considerably in quality, due partly to adulteration with related plants and partly to the use of less active portions of the pyrethrum plant. The partly opened flowers are best. This same pest attacked hardy outside ferns, especially varieties of *Athyrium* during July and August, but were finally got rid of by using a spray consisting of $\frac{1}{2}$ oz. fish oil, soap, and 1 teaspoonful dry arsenate of lead to one gallon of water, applied by very fine spray in the evening.

The second fern pest has not reached the United States as yet, but has begun to do serious damage both to greenhouse and hardy ferns in Great Britain. My information is taken from a recent number (June, 1917) of the British Fern Gazette in which the experiences of several fern growers are detailed. The pest is a small beetle, *Syragrius intrudens*, probably of Australian or-

igin, which attacks all parts of the plant. The eggs are laid in small notches gnawed in the leaf stalks. The larva burrows into the stalk, and thence downward or upward. It may penetrate the rootstock and destroy the growing cells, thus preventing further leaf formation. The larva is white and curved.

No generally successful method of destroying the insect has yet been found. In greenhouse collections it has been found possible to combat it by dipping the potted plants in water over the tops. The beetles then come to the top and can be killed. A large part, two-thirds of the collection of the Royal Botanical Garden, Dublin, was destroyed, however, before the situation was brought under control. At the same place, the entire hardy collection was so seriously affected that what remained was taken up and burned as a means of fighting the weevil. Similar experiences have been reported by other fern growers. It is not yet certain that all fern species and genera are subject to attack, according to one writer, although the Dublin experience would indicate that they are. So far none of the usual spray or gas treatments have proved of any use owing to the position of the beetle within the tissues of the plants.

R. C. BENEDICT.

LAKE GEORGE FLORA STATIONS FOR *BOTRYCHIUM LANCEOLATUM*.—In the recent catalogue of "The Ferns of the Lake George Flora, New York," *Botrychium lanceolatum* (S. G. Gmel.) Angst. was accidentally omitted. It often grows with *B. neglectum* Wood; and intergrading forms are sometimes found. It occurs in white pine woods and mixed woods of hemlock and hardwoods from June 1 to August 31. Town of Galway, Saratoga county (Mrs. Chas. S. Phelps); near Three Ponds and southern W. Fort Ann; and at Vaughns.

STEWART H. BURNHAM.

A GOOD FIND.—In a damp and shady ravine on the side of Rattlesnake Hill, Concord, N. H., some four hundred feet above sea level, Mrs. Carrie J. Elkins has discovered one plant of *Polystichum Braunii*. Search has revealed no more specimens, though granite dumps may cover others. The different authorities on ferns state this species to be found more or less frequently in Nova Scotia, New Brunswick and Quebec, Michigan, northern New England, the Lake George region and even in Pennsylvania along the mountains, but no mention is made of central New Hampshire. There is, however, one plant of *P. Braunii* in the centre of New Hampshire and I have seen it.

SARAH F. SANBORN.

A writer in the Philadelphia North American says that "some mysterious influence in the sunlight causes the fronds of the maidenhair spleenwort to wave backward and forward for a brief time after the plant has been brought into the light. Only the fertile fronds know this trick and they are most active in the middle of the day."

OPHIOGLOSSUM VULGATUM L. IN MONTANA.—This rare fern was found on the grounds of the University of Montana Biological Station at Yellow Bay, Flathead Lake, by Miss Bessie Green in 1914. Since then it has been taken by a number of people at the Station. This year sufficient plants were found to supply specimens for all of the botanists attending, about a half dozen. There are several fruiting patches growing on the edge of a little meadow near the Station building. Early in the season this meadow is submerged. This year the water did not disappear until about the middle of July. So far as I know, this species has not before been reported from Montana.

MORTON J. ELROD.